GREENIDGE MULTI-POLLUTANT CONTROL PROJECT

U.S. DOE Cooperative Agreement No. DE-FC26-06NT41426

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QUARTERLY PROGRESS REPORT
FOR WORK PERFORMED DURING THE PERIOD
May 19, 2006 to June 30, 2006

July 28, 2006

1.0 Executive Summary

As part of the Greenidge Multi-Pollutant Control Project, CONSOL Energy Inc., AES Greenidge LLC, and Babcock Power Environmental Inc. (BPEI) are installing and testing an integrated multi-pollutant control system on one of the nation's smaller existing coal-fired power plants - the 107-MWe AES Greenidge Unit 4 (Boiler 6). The overall goal of this approximately 2.5-year project, which is being conducted as part of the U.S. Department of Energy's Power Plant Improvement Initiative (PPII), is to demonstrate that the multi-pollutant control system being installed, which includes a hybrid selective non-catalytic reduction / selective catalytic reduction (SNCR/SCR) system and a Turbosorp circulating fluidized bed dry scrubbing system with recycled baghouse ash and activated carbon injection, can cost-effectively reduce emissions of NO_x, SO_2, Hg, and acid gases (SO_3, HCl, HF) from coal-fired electric generating units with capacities of 50 MWe to 600 MWe. Smaller coal-fired units, which constitute a significant portion of the nation's existing generating capacity, are increasingly vulnerable to retirement or fuel switching as a result of more stringent state and federal environmental regulations. The Greenidge Project will demonstrate the commercial readiness of an emissions control system that is particularly suited, because of its low capital and maintenance costs, to meet the requirements of this large group of existing electric generating units.

The multi-pollutant control system is depicted in Figure 1. The NO_x control system consists of commercially available combustion modifications (installed outside of the scope of the DOE project), a urea storage system, a urea dilution and injection system (SNCR), and a single-bed, in-duct SCR that is fed by ammonia slip from the SNCR process. The Turbosorp system for SO_2, SO_3 (visible emissions control), mercury, HCl, HF, and particulate matter control consists of a hydrator and hydrated lime feed system, the Turbosorp vessel, a baghouse for particulate control, and an activated carbon injection (ACI) system for mercury control. A booster fan is also being installed to overcome the pressure drop resulting from the installation of the SCR catalyst, Turbosorp, and baghouse.

Specific objectives of the project are as follows:

- Demonstrate that the hybrid SNCR/SCR system, in combination with combustion modifications, can reduce high-load NO_x emissions from the 107-MWe Greenidge Unit 4 to ≤ 0.10 lb/mmBtu (a reduction of ≥ 60% following the combustion modifications) while the unit is firing > 2%-sulfur coal and co-firing up to 10% biomass.
- Demonstrate that the Turbosorp circulating fluidized bed dry scrubber can remove ≥ 95% of the SO_2 emissions from Greenidge Unit No. 4 while the unit is firing > 2%-sulfur coal and co-firing up to 10% biomass.
- Demonstrate 90% mercury removal via the co-benefits achieved by the SNCR/SCR and Turbosorp circulating fluidized bed dry scrubber (with baghouse) systems and, as required, carbon or other sorbent injection.

- Demonstrate up to 95% removal of acid gases (sulfur trioxide, hydrogen fluoride, and hydrogen chloride) by the Turbosorp circulating fluidized bed dry scrubber.
- Evaluate process economics and performance to demonstrate the commercial readiness of an emission control system that is suitable for meeting the emission reduction requirements of boilers with capacities of 50 MWe to 600 MWe.

The Cooperative Agreement for the Greenidge Multi-Pollutant Control Project was executed on May 19, 2006. This quarterly progress report summarizes project progress during the period from May 19 through June 30, 2006, as well as during the period of DOE-approved pre-award activities that began in January 2002. Significant progress-related accomplishments during these periods include the completion of the Environmental Information Volume and the National Environmental Policy Act (NEPA) process for the project, the completion of baseline emissions testing at AES Greenidge Unit 4, and the acquisition of all permits required for construction of the multi-pollutant control facility. Detailed design of the major process components began in 2005 under pre-award authorization from DOE, and is largely complete. Purchase orders have been issued for all major process components (i.e., SNCR system, SCR reactor, SCR catalyst, activated carbon system, Turbosorp reactor, lime hydration system, baghouse, and booster fan); fabrication and delivery of these items are in progress. Construction of the multi-pollutant control facility is also underway, as a substantial amount of civil and structural construction work has been completed, and major pieces of the Turbosorp absorber and baghouse have been erected. Design, procurement, and construction activities are on track to be ready for the plant's tie-in outage, which is scheduled to begin on September 30, 2006.

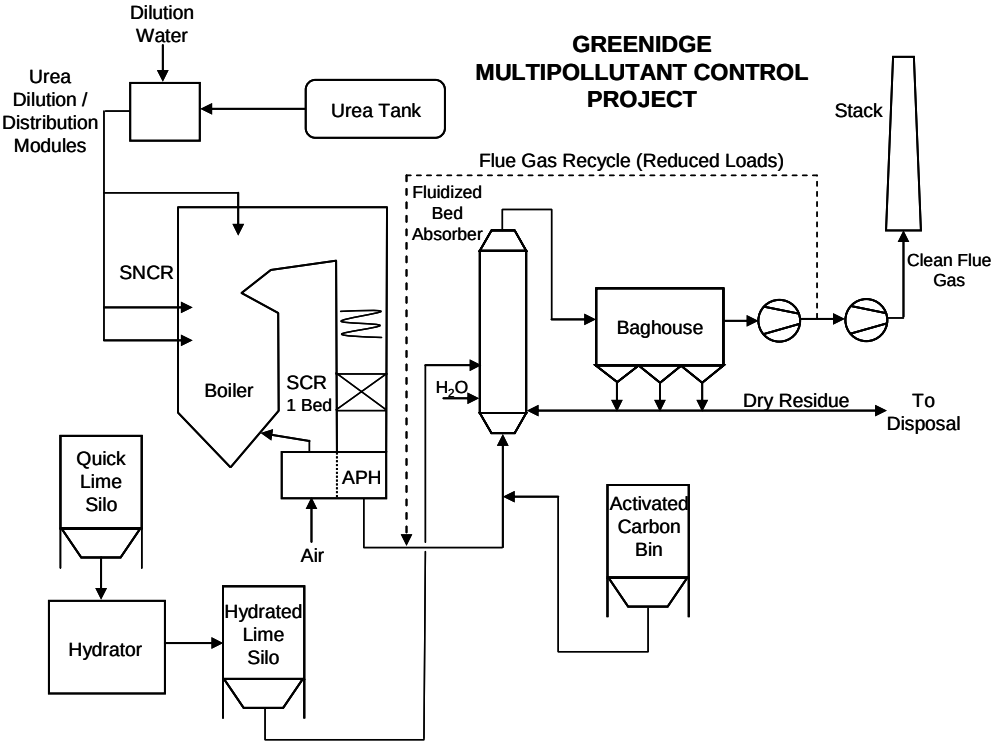

Figure 1. Multi-pollutant control system

2.0 Work Performed and Results Obtained During the Reporting Period

The Cooperative Agreement and Repayment Agreement for the Greenidge Multi-Pollutant Control Project were executed on May 19, 2006. However, in order to keep the project on pace to meet AES Greenidge's scheduled fall 2006 tie-in outage, the timing of which was driven by their Consent Decree with the State of New York and by their dispatch obligations during the peak power season, a substantial amount of Budget Period 1 work was performed prior to the signing of the Cooperative Agreement in accordance with pre-award authorizations granted by the Department of Energy (DOE). This pre-award work began in January 2002. Hence, in addition to describing project status and accomplishments during the May 19 – June 30, 2006, period, this first quarterly progress report also includes some of the significant accomplishments from the January 2002 – May 2006 period of pre-award activities. Work performed and results obtained during the reporting period and period of pre-award activities are described below by Statement of Project Objectives task number.

Tasks 1.1 and 2.1 – Project Management

The Host Site Agreement between CONSOL and AES Greenidge has been in place since April 5, 2002, and Babcock Power Environmental Inc. received a Preliminary Notice to Proceed from AES in August 2005. Drafts of the Project Agreement between CONSOL and AES Greenidge and the Engineering, Procurement, and Construction (EPC) Agreement between AES Greenidge and Babcock Power Environmental Inc. have been prepared, and are being reviewed by DOE. It is anticipated that all remaining subcontracting issues will be resolved during the next quarterly reporting period. Wolfe Huber (DOE-NETL) and Dan Connell (CONSOL R&D) visited AES Greenidge on June 7, 2006, to view progress at the site and meet with AES Greenidge (including Doug Roll, Bill Rady, Chuck Sjoberg, and Mike McCarthy) regarding the project schedule, status, risks, and various administrative topics.

Task 1.2 – Total Process Definition and Design

Definition and design of the multi-pollutant control process, including the development of process flow diagrams, piping and instrumentation diagrams, general arrangement drawings, equipment and material specifications, etc., is mostly complete. CONSOL received authorization from DOE on January 24, 2005, to begin incurring pre-award costs associated with detailed design and engineering work; hence, much of the Task 1.2 work was completed during the period of pre-award activities. BPEI began detailed schedule development and detailed process design following the issuance of the EPC Preliminary Notice to Proceed in August 2005, and detailed civil and structural design had commenced by the end of September 2005. Computational fluid dynamic (CFD) furnace modeling for the SNCR system was completed in February 2006, and physical flow and dust modeling for the in-duct SCR is underway.

During the May 19 – June 30, 2006, reporting period, AES Greenidge and BPEI met to begin developing the control philosophy for the Turbosorp and baghouse so that they can be integrated into the plant's existing control logic. Also, representatives from CONSOL, AES Greenidge, and BPEI met at BPEI's offices in Worcester, MA, to begin working on the Preliminary Public Design Report for the project. This report, which is expected to be released during the next quarterly reporting period, will consolidate all available nonproprietary design information on the multi-pollutant control system.

Remaining items under Task 1.2 include completion of process control logic design, finalization of the SCR flow and dust model (including a witness by AES Greenidge), and preparation and review of final drawings for smaller process components (e.g., sonic horn system), piping, valves, etc.

Task 1.3 – Procurement

Procurement of the multi-pollutant control system began in October 2005 under pre-award authorization from DOE. As of the signing of the Cooperative Agreement in May 2006, purchase orders had been issued for all major equipment items, including the SNCR system, SCR reactor, SCR catalyst, activated carbon system, Turbosorp reactor, lime hydration system, baghouse, and booster fan. Major purchase orders for structural steel and ductwork have also been issued. Fabrication and delivery of these items are underway. Baghouse modules were delivered to the site beginning in March 2006, and the Turbosorp reactor was shipped in April 2006. Figure 2 presents a picture of these delivered items as of mid-April 2006.

Figure 2. Photograph showing delivered baghouse modules and Turbosorp absorber sections as of April 12, 2006.

During the months of May and June 2006, purchase orders for thermocouples, thermowells, pressure switches, pressure gauges, pressure and level transmitters, NO_x and SO_2 monitors, sonic horns, catalyst seals, the catalyst cart, and some of the large bore piping systems were finalized. The activated carbon system, Turbosorp water tank, water injection pump skid, and ash silos were delivered to the site, as were conduit, cable tray, and several sections of ductwork for the Turbosorp inlet and baghouse outlet. The SNCR system was fabricated.

Procurement activities scheduled for the upcoming quarter include delivery of the lime hydration system, SNCR system, ash recirculation system, and booster fan, as well as additional shipments of structural steel, ductwork, and expansion joints. Purchase orders for smaller equipment items, piping, valves, etc., will continue to be finalized.

Task 1.4 – Environmental/Regulatory/Permitting

All permits and clearances required for construction of the multi-pollutant control facility have been obtained. AES Greenidge obtained a building permit for the multi-pollutant control facility from the Town of Torrey on August 10, 2005, and worked with the New York State Department of Environmental Conservation to determine that a Storm Water Discharge Permit was not required for construction of the facility, given the size of the construction site. AES Greenidge's Consent Decree with the State of New York authorizes them to proceed with construction and operation of the MPC facility without a pre-construction permit from the State or any changes to their existing Title V permit (although the Title V permit will be amended to reflect the Consent Decree requirements during the next regularly-scheduled renewal).

Task 1.5 – Environmental Information Volume

This task has been completed. CONSOL prepared an Environmental Information Volume for the project and submitted it to DOE on October 27, 2003. DOE prepared an Environmental Assessment (DOE/EA-1493) and issued a Finding of No Significant Impact (FONSI) for the project on December 3, 2004. This FONSI is available at http://www.eh.doe.gov/nepa/ea/EA1493/fonsi.pdf.

Task 1.6 – Baseline Testing

CONSOL performed baseline testing at AES Greenidge Unit 4 on November 17-18, 2004, in order to obtain data for use in designing the multi-pollutant control facility and to establish a baseline against which the performance of the multi-pollutant controls can be compared. The flue gas at three locations – the air heater inlet, air heater outlet, and stack – was sampled at full load conditions. All flue gas sampling (except for SO_2/SO_3 sampling) was performed isokinetically. The pollutants measured at the stack included SO_2, SO_3, HCl, HF, Hg, and particulate matter. The pollutants measured at the air heater inlet and outlet included SO_2 and SO_3. (During the gas sampling, solid samples, including coal, bottom ash, economizer hopper ash, and ESP hopper ash, were also

collected for analysis). Flue gas sampling results, which represent the average of three sampling runs at full boiler load conditions, are summarized in Table 1 below.

Table 1. Summary of baseline testing results for Greenidge Unit 4, November 17-18, 2004. Data represent the average of three sampling runs at full boiler load conditions.

Location	SO_2 ppmv	SO_3 ppmv	HCl ppmv	HF ppmv	Mercury µg/std m^3	Particulate Matter Grains/DSCF
Air Heater Inlet	1523	4.7				
Air Heater Outlet	1172	2.8				
Stack	1203	2.3	41	2.4	8.8	0.031

In addition to the full load tests, SO_2 and SO_3 concentrations at the air heater outlet were determined at low load conditions. The average concentrations of SO_2 and SO_3 at the air heater outlet at low load were and 956 ppmv and 7.1 ppmv, respectively.

Tasks 2.2 and 2.3 – General Civil/Structural and Process System Construction

In October 2005, CONSOL received pre-award authorization from DOE to mobilize for construction and begin civil construction work. Trenching and excavation of the site in areas where the new multi-pollutant control equipment is to be installed were completed in February 2006, and formwork, rebar, and concrete have since been installed for the Turbosorp absorber, baghouse, and booster fan. The containment wall for the urea tank was poured in late May 2006, and concrete was also poured for ductwork foundations and piers beneath the existing precipitator in June 2006.

We received further authorization from DOE in January 2006 to begin certain process system construction activities. Consistent with this authorization, installation of structural steel for the baghouse began in March 2006, and the baghouse modules and hoppers had been raised into place by the end of May 2006. The structural steel frame for the Turbosorp was also erected in May, and the Turbosorp vessel was raised into place and welded in June (with the exception of the roof, which will not be installed until work on the inside of the vessel is complete).

Also during the May 19 - June 30 reporting period, several sections of ductwork around the Turbosorp vessel and baghouse were lifted into place, and installation of the baghouse penthouse commenced. Work on insulating and lagging the baghouse and on installing structural steel, grating, and handrails proceeded throughout this period. The electrical subcontractor mobilized on site. Figure 3 depicts the status of Turbosorp and baghouse construction as of June 30, 2006.

A number of major construction activities are scheduled to occur during the upcoming quarter in preparation for the fall tie-in outage. These activities include completion of

the Turbosorp vessel and baghouse installations, as well as installation of the lime hydration system, booster fan, SNCR skids, and various pieces of ductwork. Work on Task 2.4 is also scheduled to begin next quarter with the preparation of training and operating manuals and commencement of the training program. The tie-in outage is scheduled to begin on September 30, 2006; no changes to this schedule are anticipated.

Figure 3. Photograph showing Turbosorp and baghouse construction progress as of June 30, 2006.

3.0 Status Reporting

3.1 Cost Status

The forecasted cash needs shown in our SF424A-Section D were projected on the basis of project quarters (i.e., such that the first project quarter was the period from June 1, 2006, through August 31, 2006, based on the assumption of a June 1 Cooperative Agreement signing date) rather than calendar quarters, and were offset by one month from the month in which they were expected to be incurred in order to reflect the fact that invoices are typically submitted (and hence cash flows typically occur) at least a month after costs are actually incurred. However, because we are being required to report cost status at the end of each calendar quarter, we have adjusted the baseline to show projected costs by calendar quarter with no offset (Table 2), and will use this baseline by calendar quarter in each of our quarterly progress reports. Hence, the projection shown in Table 2 was based on the same forecasted monthly costs that were used to compute the projection shown in our SF424A form, but was based on a different definition of quarter (calendar quarter rather than project quarter) to provide the comparisons being requested.

As shown in Table 2, actual incurred costs for the second quarter of calendar year 2006 (which include costs incurred between May 19 and June 30, 2006, as well as authorized costs incurred during the pre-award period from January 2002 through May 18, 2006) were $1,374,033 less than baseline planned costs for that quarter. This variance is largely attributable to the fact that finalization of the SCR flow/dust model and deliveries of the lime hydration system and SNCR skid-mounted equipment were behind schedule as of the end of June, and hence, payments for milestones associated with these activities did not occur during the reporting period as anticipated. However, these activities are expected to be completed and the associated payments made during the upcoming reporting period. Project administration costs during the period were also slightly less than budgeted, because the Cooperative Agreement (and hence all of its reporting and other administrative requirements) was only in effect for a portion of the reporting period. In addition, as shown in Table 2, we have not yet invoiced DOE for any of the incurred costs; invoicing is expected to commence during the next quarterly reporting period once the major subcontracts between CONSOL and AES Greenidge and between AES Greenidge and BPEI are in place.

Table 2. Cost plan/status, where baseline costs from Form 424A have been adjusted so that they are shown by calendar quarter.

Baseline Reporting Quarter	YEAR 1 Start: 1/1/2006 End: 12/31/2006				YEAR 2 Start: 1/1/2007 End: 12/31/2007				YEAR 3 Start: 1/1/2008 End: 12/31/2008			
	Q1	Q2[a]	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Baseline Cost Plan By Calendar Quarter												
Federal Share		$7,437,962	$1,806,535	$2,142,302	$1,680,384	$278,239	$228,040	$228,040	$242,595	$303,883	$161,730	
Non-Federal Share		$9,543,687	$2,317,974	$2,748,798	$2,156,109	$357,009	$292,599	$292,599	$311,274	$389,914	$207,516	
Total Planned (Federal and Non-Federal)		$16,981,649	$4,124,509	$4,891,100	$3,836,493	$635,248	$520,639	$520,639	$553,869	$693,797	$369,246	
Cumulative Baseline Cost		$16,981,649	$21,106,158	$25,997,258	$29,833,751	$30,468,999	$30,989,638	$31,510,276	$32,064,145	$32,757,942	$33,127,188	
Actual Incurred Costs[b]												
Federal Share		$6,836,136										
Non-Federal Share		$8,771,480										
Total Incurred Costs-Quarterly (Federal and Non-Federal)		$15,607,616										
Cumulative Incurred Costs		$15,607,616										
Variance[c]												
Federal Share		($601,826)										
Non-Federal Share		($772,207)										
Total Variance-Quarterly (Federal and Non-Federal)		($1,374,033)										
Cumulative Variance		($1,374,033)										
Actual Costs Invoiced to DOE												
Federal Share		$0										
Non-Federal Share		$0										
Total Invoiced Costs-Quarterly (Federal and Non-Federal)		$0										
Cumulative Invoiced Costs		$0										

[a]Costs for Q2 2006 include costs for that quarter as well as pre-award costs incurred beginning in January 2002. [b]Actual incurred costs are all costs incurred by the project during the quarter, regardless of whether these costs have been invoiced. [c]Negative variance, ( ), means that actual incurred costs are less than baseline planned costs.

3.2 Milestone Status

The critical path project milestone plan (from the Statement of Project Objectives for the project) and status for the Greenidge Multi-Pollutant Control Project are shown in Table 3. As shown in the Table, the first of the project's six critical path project milestones ("Initiate scrubber system installation") was achieved during the current reporting period (second quarter of calendar year 2006), one quarter ahead of the target of the third quarter of calendar year 2006. Installation of the scrubber vessel began on May 30, 2006, when the Turbosorp inlet cone was raised into place, as shown in Figure 4. We were able to meet this milestone ahead of schedule because we succeeded in proceeding with construction activities (under pre-award authorizations from DOE) while Cooperative Agreement negotiations were still underway. The next critical path project milestone calls for the tie-in outage to begin during the fourth quarter of calendar year 2006. We do not anticipate that any changes in the project schedule will be required to complete this critical path milestone.

Figure 4. Photograph showing the Turbosorp inlet cone being raised into place on May 30, 2006.

Table 3. Milestone plan / status report.

Critical Path Project Milestone Description	Project Duration - Start: 5/19/06 End: 10/18/08												Planned Start Date	Planned End Date	Actual Start Date	Actual End Date	Comments (notes, explanation of deviation from baseline plan)
	2006				2007				2008								
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4					
Initiate scrubber system installation		A	P										9/30/06	9/30/06	5/30/06	5/30/06	See text under Section 3.2.
Commence tie-in outage				P									12/31/06	12/31/06			
Begin guarantee/performance testing					P								3/31/07	3/31/07			
Begin routine plant operation and data collection for long-term testing						P							6/30/07	6/30/07			
Begin follow-up testing										P			6/30/08	6/30/08			
Complete analyses of process performance and economics											P		9/30/08	9/30/08			

NOTE: “A” indicates actual completion; “P” indicates planned completion.

4.0 Significant Accomplishments during the Reporting Period

Because the Cooperative Agreement was signed partway through the quarter and the project is still in the design, procurement, and construction phases, no results concerning the performance of the multi-pollutant control facility are yet available. Significant progress-related accomplishments during the reporting period and the preceding period of pre-award activities, which are described more fully in Section 2.0 above, are as follows:

- Completion of the Environmental Information Volume and the National Environmental Policy Act (NEPA) process for the project.
- Completion of baseline emissions testing at AES Greenidge Unit 4.
- Acquisition of permits required for construction of the multi-pollutant control facility.
- Substantial completion of the design of major process components.
- Issuance of purchase orders for major equipment items.
- Installation of major pieces of the Turbosorp absorber and the baghouse.

5.0 Problems/Delays and Actions Taken/Planned to Resolve Them

No events occurred during the reporting period that are expected to cause significant schedule slippage or cost growth or to adversely impact important performance objectives. Issues regarding delays in the delivery of structural steel and of low- and medium-voltage switchgear were resolved with no anticipated effect on the overall project schedule. Heavy rains in the northeastern U.S. resulted in one unanticipated day of lost work on site during June; overall, however, site work is on track to meet the scheduled fall tie-in outage.

6.0 Products Produced and Technology Transfer Activities Accomplished During the Reporting Period

As of the end of the reporting period, the project has been officially underway for just over a month, and therefore has not yet generated any deliverables.